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U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards



**FLEXIBLE DISK CARTRIDGE  
LABELLING AND FILE STRUCTURE FOR  
INFORMATION INTERCHANGE**

FIPS PUB 118

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**EGORY: SOFTWARE STANDARD**

**CATEGORY: OPERATING PROCEDURE**

**U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, Secretary  
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director**

**Foreword**

The Federal Information Processing Standards Publication Series of the National Bureau of Standards is the official publication relating to standards adopted and promulgated under the provisions of Public Law 89-306 (Brooks Act) and under Part 6 of Title 15, Code of Federal Regulations. These legislative and executive mandates have given the Secretary of Commerce important responsibilities for improving the utilization and management of computers and automatic data processing in the Federal Government. To carry out the Secretary's responsibilities, the NBS, through its Institute for Computer Sciences and Technology, provides leadership, technical guidance, and coordination of Government efforts in the development of guidelines and standards in these areas.

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**Abstract**

This standard prescribes a set of logical track format specifications for flexible disk cartridges described in the following physical track format standards; FIPS PUB 114, FIPS PUB 115, FIPS PUB 116, and FIPS PUB 117.

Key words: Computers; computer system hardware; data interchange; data processing; data processing equipment; flexible disk cartridges; information systems; magnetic recording; standards.

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**Federal Information  
Processing Standards Publication 118**

1985 September 30

Announcing the Standard for

**Flexible Disk Cartridge Labelling and  
File Structure for Information Interchange**



Federal Information Processing Standards Publications are issued by the National Bureau of Standards pursuant to section 111(f)(2) of the Federal Property and Administrative Services Act of 1949, as amended, Public Law 89-306 (79 Stat. 1127), Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 Code of Federal Regulations (CFR).

**Name of Standard.** Flexible Disk Cartridge Labelling and File Structure for Information Interchange (FIPS PUB 118).

**Category of Standard.** Software, Operating Procedure.

**Explanation.** This standard prescribes a set of logical track format specifications for different technologies of flexible disk cartridges which can be categorized by physical size, data density (bits per radian (bprad)), track density (tracks per millimeter (tpmm) or tracks per inch (tpi)), etc., as described in the following physical track format standards:

130 mm (5.25 in) Flexible Disk Cartridge Track Format Using Two-Frequency Recording at 3979 bprad on One Side - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 116),

130 mm (5.25 in) Flexible Disk Cartridge Track Format Using Modified Frequency Modulation Recording at 7958 bprad on Two Sides - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 117),

200 mm (8 in) Flexible Disk Cartridge Track Format Using Two-Frequency Recording at 6631 bprad on One Side - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 114), and

200 mm (8 in) Flexible Disk Cartridge Track Format Using Modified Frequency Modulation Recording at 13262 bprad on Two Sides - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 115).

Citing these specifications will help to ensure that interchange parties can reliably interchange data files between information processing systems.

In order to ensure interchangeability of data between information processing systems by use of a physically removable medium, three distinct levels of compatibility specifications are necessary:

- 1) specifications for the unrecorded interchange medium (e.g., the flexible disk cartridge),
- 2) specifications for the physical track format (referenced above),
- 3) specifications for the logical track format (the specifications in this document).

Interchange of text, rather than data files, requires other specifications in addition to the above three levels.

Further physical track format specifications are being developed through the international and national voluntary industry standards process. These specifications will define higher track densities, higher data densities, and/or different sizes of flexible disk cartridges. When these approved specifications become available, they will be considered for inclusion into this series of Federal Information Processing Standards Publications (FIPS PUBS).

**Maintenance Agency.** Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).

**Cross Index.** International Organization for Standardization (ISO) 7665, Information Processing - File Structure and Labelling of Flexible Disk Cartridges for Information Interchange.

#### **Related Documents.**

- a. American National Standard Code for Information Interchange, X3.4-1977, FIPS PUB 1-2.
- b. American National Standard Code Extension Techniques for Use with the 7-Bit Coded Character Set of American National Standard Code for Information Interchange, X3.41-1974, FIPS PUB 1-2.
- c. American National Standard Additional Controls for Use with American Standard Code for Information Interchange, X3.64-1979, FIPS PUB 86.
- d. American National Standard for Single-Sided Unformatted Flexible Disk Cartridge (for 6631-BPR Use), X3.73-1980.
- e. American National Standard for Single Sided Unformatted Flexible Disk Cartridge (for 3979-BPR Use), X3.82-1980.



f. American National Standard for Information Systems - Two-Sided, Unformatted, 8-in (200-mm), 48 tpi, Double-Density, Flexible Disk Cartridge-General, Physical, and Magnetic Requirements for 13262 ftpr Two-Headed Application, X3.121-1984.

g. American National Standard for Information Systems - Two-Sided, Double-Density, Unformatted, 5.25-Inch (130-mm), 48-tpi (1.9-tpmm), Flexible Disk Cartridge for 7958 bpr Use - General, Physical, and Magnetic Requirements, X3.125-1985.

h. ISO 5654/2 - Data Interchange on 200 mm (8 in) Flexible Disk Cartridges Using Two-Frequency Recording at 13 262 ftprad on One Side - Part 2: Track Format.

i. ISO 6596/2 - Data Interchange on 130 mm (5.25 in) Flexible Disk Cartridges Using Two-Frequency Recording at 7 958 ftprad, 1,9 tpmm (48 tpi), on One Side - Part 2: Track Format.

j. ISO 7065/2 - Data Interchange on 200 mm (8 in) Flexible Disk Cartridges Using Modified Frequency Modulation Recording at 13 262 ftprad, 1,9 tpmm (48 tpi), on Both Sides - Part 2: Track Format.

k. ISO 7487/3 - Data Interchange on 130 mm (5.25 in) Flexible Disk Cartridges Using Modified Frequency Modulation Recording at 7 958 ftprad, 1,9 tpmm (48 tpi), on Both Sides - Part 3: Track Format B.

**Applicability.** This standard is applicable to the acquisition and use of all recording and reproducing equipment employing flexible disk cartridges described in the following track format standards:

130 mm (5.25 in) Flexible Disk Cartridge Track Format Using Two-Frequency Recording at 3979 bprad on One Side - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 116),

130 mm (5.25 in) Flexible Disk Cartridge Track Format Using Modified Frequency Modulation Recording at 7958 bprad on Two Sides - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 117),

200 mm (8 in) Flexible Disk Cartridge Track Format Using Two-Frequency Recording at 6631 bprad on One Side - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 114), and

200 mm (8 in) Flexible Disk Cartridge Track Format Using Modified Frequency Modulation Recording at 13262 bprad on Two Sides - 1.9 tpmm (48 tpi) for Information Interchange (FIPS PUB 115).

Federal information processing systems employing such equipment, including associated software, should provide the capability to accept and generate recorded flexible disk cartridges in compliance with the requirements set forth in this standard. This standard should be used for the interchange of flexible disk cartridges unless the interchange parties can agree upon an alternate interchange format which is more efficient, convenient, and cost effective.

**Specifications.** This standard incorporates by reference (with qualifications as noted) the technical specifications of ISO 7665, Information Processing - File Structure and Labelling of Flexible Disk Cartridges for Information Interchange.

**Qualifications.**

a. ISO 7665 specifies three nested levels of interchange. For the purposes of this standard, the level called "basic interchange" is required for conformance to this standard. The levels of interchange called "extended interchange level 1" and "extended interchange level 2" are optional.

b. ISO 7665 specifies the use of ISO 646, ISO 2022, and ISO 4873. For the purposes of this standard, American National Standard Code for Information Interchange, X3.4-1977 (defined in FIPS PUB 1-2), American National Standard Code Extension Techniques for Use with the 7-Bit Coded Character Set of American National Standard Code for Information Interchange, X3.41-1974 (defined in FIPS PUB 1-2), and American National Standard Additional Controls for Use with American Standard Code for Information Interchange, X3.64-1979 (defined in FIPS PUB 86) replace all references to ISO 646, 2022, and 4873. All labels should be recorded in the character code defined in FIPS PUB 1-2.

c. The following additional qualifications are to be applied to ISO 7665:

1. Delete section 2, CONFORMANCE.
2. Replace all occurrences of "Cylinder-Limit" with "the upper cylinder address limit."
3. Replace all occurrences of "Index-Sector-Limit" with "the number of the last sector."
4. Replace TABLE 3, Data Interchange Standards and Parameter Recording-Type, with the following:

TABLE 3 - Data Interchange Standards and Parameter Recording-Type

Standard Reference	Format Indicator
200 mm Cartridge	
ISO 5654/2	1
ISO 7065/2	M
130 mm Cartridge	
ISO 6596/2	1
ISO 7487/3	M

5. Replace section 7.4.1 with the following section:

7.4.1. The file organization shall be sequential (i.e., cylinders, sides, tracks, and sectors shall be recorded in the natural order).

6. Replace section 8.4.8, Physical Record Length Identifier (CP 76), with the following section:

#### 8.4.8 Physical Record Length Identifier (CP 76)

This field shall specify the length of all physical records on all cylinders other than cylinder 00.

The characters in this field shall be SPACE or a digit.

SPACE shall mean that the length of all physical records is 128 bytes

1 shall mean that the length of all physical records is 256 bytes.

7. Replace section 8.4.9, Sector Sequence Indicator (CP 77 to 78), with the following section:

#### 8.4.9 Sector Sequence Indicator (CP 77 to 78)

This field shall specify the sequence of the sectors on the tracks.

The characters in this field shall be SPACE and digits.

SPACES or 01 shall each mean that the sectors are in the natural order.

8. Replace the second paragraph in section 6.2, Number of Sides, with the following:

Where this standard specifies requirements for labels and data on side 1, such requirements shall only apply to those types of flexible disk cartridges designated in table 3 with a Format Indicator value of M.

9. Replace the first paragraph in section 6.3, Organization of Space on a Flexible Disk Cartridge, with the following:

The data interchange standards listed in table 3 designate lower and upper cylinder address limits.

10. Replace the first two paragraphs in section 6.4, Index Cylinder (Cylinder 00), with the following:

The index cylinder (cylinder 00) on a flexible disk cartridge shall be reserved for descriptive information about the volume and the data recorded on the volume. The index cylinder shall always be formatted with physical records that have a length of at least 128 data characters.

The number of physical records that shall appear on both tracks of the index cylinder shall be equal to the number of the last sector specified in the related data interchange standard designated in table 3.

11. Replace the second paragraph in section 6.5, Contents of Cylinders with Addresses 01 to Upper Cylinder Address Limit, with the following:

These cylinders shall be formatted with physical records whose length in data characters shall be equal to the number of bytes in the data field defined for these cylinders in the designated data interchange standard listed in table 3.

12. Replace a) in section 8.2, Justification of Characters with the following:

a) in each field the contents of which is specified by this standard to be SPACeS or digits, digits shall be right-justified, and any remaining positions on the left shall be filled only with zeros.

13. Add the following sentence to the end of section 8.5.20, Expiration Date (CP 67 to 72):

A file may not be deleted if Write Protect (CP 43) contains P.



14. Delete the first and third paragraphs in section 11.2, Basic Interchange.

15. Delete the first sentence in section 11.3, Extended Interchange Level 1.

16. Delete the first sentence in section 11.4, Extended Interchange Level 2.

17. Delete the last sentence in section 11.5, Files Not Conforming to Specified Interchange Levels.

**Implementation Schedule.** This standard becomes effective April 1, 1986. Use by Federal agencies is strongly recommended when such use contributes to operational benefits, efficiency, or economy.

**Special Information.** Each agency has the responsibility for the procurement of compatible, unrecorded flexible disk cartridges. The other standards in this series contain further information on ordering compatible media for each specific physical track format.

**Where to Obtain Copies.** Copies of this publication are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161. (Sale of the included specifications document is by arrangement with the American National Standards Institute.) When ordering, refer to Federal Information Processing Standards Publication 118 (FIPS PUB 118), and title. Payment may be made by check, money order, purchase order, credit card, or deposit account.



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